

## **APPENDIX H**

---

# **PRE-CONSTRUCTION SOIL AND GROUNDWATER CHARACTERIZATION REPORT**



**WINZLER & KELLY**  
CONSULTING ENGINEERS

Ref: 04-258702-305

February 28, 2005

Mr. John Jang  
Water Resource Control Engineer  
San Francisco Bay RWQCB  
1515 Clay Street, Suite 1400  
Oakland, CA 94612

**Re: Pre-Construction Soil and Groundwater Characterization Report for the  
Condemned Inmate Complex, San Quentin State Prison, San Quentin, California**

Dear Mr. Jang:

The California Department of Corrections is developing plans for the construction of a new condemned inmate complex to be located at the San Quentin prison (site). The Environmental Impact Report process is nearing completion and comments are being addressed.

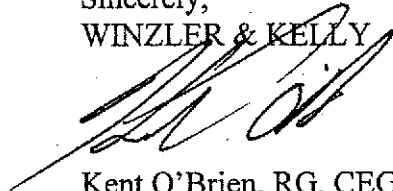
In preparation for construction, Winzler & Kelly prepared an October 2004 Workplan for Soil and Groundwater Characterization. A copy of this Workplan was forwarded to you on October, 18 2004. The enclosed submittal documents the findings of implementing this Workplan. The purpose of the Workplan was to identify areas where construction-related soil excavation and groundwater removed during dewatering activities may require special handling. In general, the findings indicated very low levels of constituents of concern below the residential preliminary remediation goals (PRGs). In localized areas there were indications of hydrocarbons within the oil and grease range. However, these detections may also be the result of natural reoccurring degradation of plant matter. Details of these findings are provided in the enclosed report.

This submittal also includes project specifications directing the contractor in proper soil and groundwater management practices. These specifications have been developed so that in the event that the constituents of concern are identified during the construction, the soil and groundwater will be properly managed to prevent the improper handling of contaminated materials.

Mr. John Jang  
February 28, 2005  
Page 2

Construction of the project is scheduled for the late summer of 2005. The final submittal of the design documents is scheduled for June 1, 2005. Should you have questions regarding the soil and groundwater handling process please contact Winzler & Kelly prior to April 30, 2005. This will allow us enough time to be responsive to your input.

Sincerely,  
WINZLER & KELLY



Kent O'Brien, RG, CEG  
Senior Project Manager

Attachments

c: Geoff Marmas, Kitchell, 501 "J" Street, Suite 1200, Sacramento, CA 95814  
Amanda Olekszulyn, EDAW, 2022 J Street, Sacramento, CA 95814  
Marc Solomon, Winzler & Kelly, 495 Tesconi Circle, Santa Rosa, CA 95401

# **PRE-CONSTRUCTION SOIL AND GROUNDWATER CHARACTERIZATION REPORT**

**CONDEMNED INMATE COMPLEX  
San Quentin State Prison  
San Quentin, California**

**February 2005**

**Prepared for:  
California Department of Corrections**

**Prepared by:**



**WINZLER & KELLY**  
CONSULTING ENGINEERS

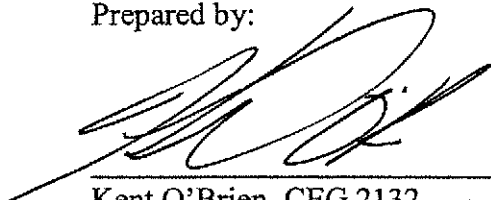
495 Tesconi Circle  
Santa Rosa, CA 95401  
(707) 523-1010

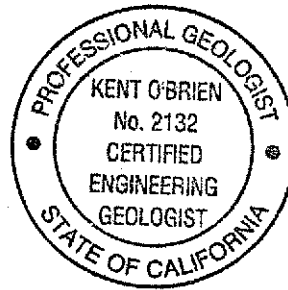
# PRE-CONSTRUCTION SOIL AND GROUNDWATER CHARACTERIZATION REPORT

CONDEMNED INMATE COMPLEX, SAN QUENTIN STATE PRISON  
SAN QUENTIN, CALIFORNIA

Prepared for:  
California Department of Corrections

Prepared by:

  
Kent O'Brien, CEG 2132  
Senior Project Geologist



February 2005

Reviewed by:   
Date: 3/1/05

# TABLE OF CONTENTS

1.0	Introduction.....	1
1.1	Site Geology and Hydrogeology .....	2
2.0	Areas of Environmental Concern.....	2 ✓
3.0	Procedures.....	3
4.0	Results.....	3 ✓
4.1	Scrap Metal and Recycling Area.....	3
4.2	Detergent Plant.....	4
4.3	Wastewater Treatment Plant .....	4
4.4	Landscaping/Pest Control Area.....	5
4.5	Outside Maintenance Yard.....	5
5.0	Additional Actions.....	5 ✓
5.1	Survey.....	5
5.2	Soil and Water Storage and Disposal .....	5
6.0	Summary.....	6
6.1	Hazardous Materials Specifications .....	6 ✓

## Attachments:

## Figures:

- Figure 1 – Site Vicinity Map
- Figure 2 – Site Location Map
- Figure 3 – Existing Facilities Map
- Figure 4 – Preliminary Design
- Figure 5 – Soil Boring and Sample Locations
- Figure 6 – Draft Site Stabilization Plan

## Tables:

- Table 1 – Summary of Activities in Areas of Concern ✓
- Table 2 – Analytical Schedule
- Table 3 – Soil Sample Analytical Results
- Table 4 – Groundwater Analytical Results

## Appendices:

- Appendix A – Winzler & Kelly's October 2004 Workplan and Drilling Permit
- Appendix B – Kleinfelder's August 10, 1990 Phase I and November 15, 1990 Phase II Reports
- Appendix C – Site-Specific Sampling Procedures
- Appendix D – Field Boring Logs
- Appendix E – Well Sampling Data Sheets
- Appendix F – Analytical Laboratory Reports
- Appendix G – Draft Specifications for Contaminated Materials Handling and Disposal

## 1.0 INTRODUCTION

This investigation was performed by Winzler & Kelly Consulting Engineers (Winzler & Kelly) in preparation of the design and construction of the Condemned Inmate Complex (CIC) at San Quentin State Prison (Figure 1). The CIC project is proposed to be constructed at the location of the existing minimum security area. The area for the proposed CIC is approximately 34 acres in size and located on the western edge of the San Quentin Prison (Figure 2). Currently, the minimum security area is developed with dormitories and other inmate facilities, the landscape department, outside maintenance area, an abandoned detergent factory, a recycling area, and an abandoned wastewater treatment plant (Figure 3). These structures are all to be removed prior to development of the CIC.

The CIC will be developed with approximately 15 buildings including: inmate housing, administration and office, health services, and other ancillary uses. It is anticipated that the housing units will be of heavy, concrete construction, two stories in height. The other buildings are anticipated to be one story. A preliminary concept drawing is provided in Figure 4.

The purpose of the Winzler & Kelly investigation was to collect soil and groundwater samples in areas where known past uses may have impacted soil or groundwater. This work was conducted as a precaution for the construction workers and to plan for soil and groundwater management during construction. Winzler & Kelly also collected samples at the abandoned wastewater treatment plant to characterize the biosolids for disposal during site construction.

This sampling program was developed by Winzler & Kelly and presented in their October 2004 *Workplan for Soil and Groundwater Characterization* (Workplan). A copy of this Workplan (without attachments) is provided in Appendix A. Winzler & Kelly developed the scope of work based on previous investigations performed in 1990 as part of the planning phase for development of this project. The workplan was forwarded to the San Francisco Regional Water Quality Control Board (Mr. John Jang, October 18, 2004) prior to field activities. Drilling permits were obtained from the Marin Community Development Agency, Environmental Health Services prior to site work (Appendix A).

There are two previous reports related to potential soil or groundwater contamination at the site. The first is an August 10, 1990 *Phase I Environmental Assessment* (Phase I) report prepared by Kleinfelder, Inc. (Kleinfelder) and the second is the November 15, 1990 *Limited Phase II Site Assessment* (Phase II) report also prepared by Kleinfelder. Kleinfelder's August 1990 Phase I report provided a review of historical site uses and a site inspection for potentially hazardous materials. The Phase I report included recommendations for soil sampling to identify impacts that may have occurred due to site uses. The November 15, 1990, Kleinfelder Phase II report documented the implementation of the soil sampling recommendations made in the Phase I report. Copies of these reports are provided in Appendix B. The conclusions of these reports are discussed in Section 2.0.

This report describes the collection of samples from five areas at the site. These areas are: 1) the recycling area, 2) the detergent plant area, 3) the wastewater treatment plant, 4) the landscaping/pest control area, and 5) the outside maintenance area.

## 1.1 – Site Geology and Hydrogeology

The site is located on the southern shore of Point San Quentin adjacent to the San Francisco Bay (Bay). The location of the site is presented in Figures 1 and 2. The prison property is bounded on the north and west by a ridge and on the south and east by the Bay (Figure 2). Much of the area proposed for construction is filled land reclaimed from the Bay.

The western and northern portions of this parcel are underlain by bedrock, while the center, southern, and eastern portions of the area are underlain by fill material emplaced over Bay Mud and alluvium. The site is underlain by three distinct units. At the north end of the site is Quaternary Colluvium. This is generally unconsolidated and unsorted soil material accumulated at the base of hills north of the site. At the west end of the site are mixtures of sandstone, siltstone, and shale. The south and east portions of the site are underlain by artificial fills which overlie Bay Mud and alluvium.

Groundwater flow direction at the site is not known. However, it is expected to flow towards the Bay at a very low gradient.

## 2.0 AREAS OF ENVIRONMENTAL CONCERN

The concentrations of contaminants in the soil identified during the 1990 Phase II work (Kleinfelder) indicate minor impacts which were unlikely to have significantly affected groundwater. However, groundwater was not sampled during the previous efforts. During this current investigation, soil samples were collected to verify, and further delineate, the previous findings. In addition, groundwater samples were collected and analyzed to determine if groundwater has been impacted and if it would require treatment during dewatering operations related to construction of the CIC.

A number of areas were investigated as part of the Phase I work performed in July of 1990 (August, 10 1990 Phase I report). Some areas were identified as having potential environmental impacts to soil. Soil samples were collected from these areas by Kleinfelder in September of 1990 (November 15, 1990 Phase II report) to resolve the concerns that were identified in the Phase I. The November 15, 1990 Phase II report documents the findings of this sampling effort. A copy of this report was provided in Winzler & Kelly's October 2004 Workplan for this project (Appendix A). Table 1 provides a summary of the findings of each of the Kleinfelder reports and the related activities performed during the current investigation.

From October 27 to 29, 2004, Winzler & Kelly performed the field work that included completing 12 soil borings, which were installed using direct push drilling equipment operated by Precision Drilling. Both soil and groundwater samples were collected from these borings. In addition, shallow soil samples were collected from the abandoned wastewater treatment plant. Winzler & Kelly also collected groundwater samples from three previously installed groundwater monitoring wells. Soil and groundwater sample collection procedures are provided in Appendix C. Figure 5 shows the boring and sampling locations. Details of our investigation are provided in the discussion below.



### 3.0 PROCEDURES

Soil and groundwater sampling was performed in the vicinity of the Detergent Plant and Recycling Areas where contaminants were found in the shallow soils during the 1990 Kleinfelder sampling effort. Samples were also collected in the Maintenance Area, Landscape Area, and Pest Control Area where soil and groundwater may have been impacted because of continued use of potentially hazardous materials in these areas.

Soil and groundwater sampling was also performed at the former wastewater treatment plant to pre-characterize biosolids for disposal and verify that groundwater has not been adversely affected. This task included the collection of soil/sludge samples from the drying beds of the former wastewater treatment plant digester. This organic material will be hauled to a landfill or land farmed under permit during construction.

The sampling consisted of the installation of 12 soil borings in the project area. Copies of the boring logs are presented in Appendix D. Except in the drying beds of the former wastewater treatment plant, all the soil and groundwater samples were collected using direct push continuous core methods. The depth of the soil borings varied from approximately 10 to 15 feet below ground surface (bgs).

Soil and groundwater samples were retained from soil borings for chemical analyses. Copies of the Well Sampling Data Sheets are provided in Appendix E. All samples were submitted under chain-of-custody procedure to Analytical Sciences Laboratories of Petaluma, a California-certified analytical laboratory. Soil samples were analyzed for contaminants based on past use or previous findings. The analyses are summarized in Table 2 and the results are summarized in Tables 3 and 4. The full laboratory analytical reports are provided in Appendix F.

### 4.0 RESULTS

#### 4.1 – Scrap Metal and Recycling Area

Soil borings (WK-1 through WK-4) were installed in this area. Soil borings WK-2 and WK-3 encountered shallow refusal in bedrock and therefore were not sampled for soil or groundwater. Soil samples were analyzed for total petroleum hydrocarbons (TPH) fingerprint by USEPA 8015M, volatile and semi-volatile organics by USEPA 8260, and USEPA 8270. There were no detections of any of these constituents in the soil. Soil boring WK-1 encountered refusal at 4 feet bgs and was dry at this depth. A groundwater sample was collected from WK-4 which was completed to refusal at 10 feet bgs. However, only a small volume of water was available, so analyses were limited to volatile organics by USEPA 8260. There were no detections of any constituents of concern in this groundwater sample.

Kleinfelder detected TPH as oil and grease in two shallow soil samples (Kleinfelder B-5 and B-6, see Winzler & Kelly's October 2004 Workplan) collected in the vicinity of Winzler & Kelly soil boring WK-4. Our analysis did not confirm the presence of TPH as oil and grease in this area. Our sampling did not detect oil or grease in either the shallow or deeper soil samples. In addition, there were no volatile organics detected in the groundwater sample from WK-4.

Therefore, encountering significant contamination in the soil or groundwater within this work area is unlikely during construction activities.

#### 4.2 – Detergent Plant

Soil borings WK-5, WK-7, and WK-9 were installed in this area. WK-8 was not installed because an existing monitoring well (Detergent Plant well) was found at the location proposed for this boring. A sample of groundwater was collected from this well and analyzed. In addition, boring WK-6 was not installed because a monitoring well installed by Kleinfelder (during their geotechnical investigation in 2004, boring B-12) was installed near the proposed location. This well was also sampled for groundwater.

Analysis for Methylene Blue Active Substrate (MBAS) was included in the analytical request. This is a method for detecting detergents. In addition, the standard analysis for phosphate and sulfate was used, because both of these compounds are often found in detergents. Sulfate (and sulfide) is also found in sea water and Bay Mud deposits. WK-5 was analyzed for TPH-fingerprint by USEPA 8015M, volatile and semi-volatile organics by USEPA 8260, and USEPA 8270. It was also analyzed for MBAS, phosphate, and sulfate. While the shallow soil sample from WK-5 was non-detect for all constituents except sulfate, the deeper sample at 4 feet contained hydrocarbons in the diesel and motor oil ranges. However, the lab identified fine wood material and peaks which may indicate plant oils or pigments. The detections may be related to organic matter in the mud deposits.

Groundwater samples collected indicated low levels of MBAS. In addition, WK-9 has a detection of hydrocarbons in the diesel range at a concentration of 99 µg/L. However, this detection was flagged by the laboratory as not matching the chromatographic pattern for diesel and may be the result of natural products.

Soil excavated from the area between the detergent plant building and the recycling area should be field screened for hydrocarbons to ensure proper handling during construction. However, this soil may contain only organic matter. Groundwater pumped from this area may contain low levels detergent and should be disposed to the sanitary sewer after obtaining the proper permits.

#### 4.3 – Wastewater Treatment Plant

Three locations were sampled (WK-10, WK-11, and WK-12) in the wastewater treatment plant area. All of these soil samples were analyzed for nitrogen compounds and one of the samples was analyzed for pesticides. All the results for nitrogen compounds were within background concentrations. The results of the pesticide analysis were non-detect. Groundwater samples collected from borings WK-10, WK-11, and WK-12 were analyzed for nitrogen compounds. Groundwater from WK-11 was also analyzed for CAM 17 metals. The results of both the nitrogen compounds and metals were below the maximum contaminant levels (MCLs) established by the U.S. Environmental Protection Agency or the secondary standard. Based on these findings, no additional work is required in this area except in the drying beds as discussed below.

Samples were also collected from the drying beds. These samples were composited and analyzed for nitrogen compounds and CAM 17 metals. There were detections above background within

these samples of both the nitrogen compounds and some metals. Nitrate and lead are particularly elevated. In addition, razor blades and other debris were identified in the soil.

In the area of the wastewater treatment plant, soil from the drying beds should be excavated down two feet bgs and piled for re-sampling and profiling for disposal to an appropriate landfill. The soil is most likely going to qualify for a Class II facility. Groundwater in this area does not appear to be impacted. \*

#### **4.4 – Landscaping/Pest Control Area**

Soil and groundwater samples were collected from both these areas (borings WK-13 and WK-16). The samples were analyzed for volatile organics by USEPA 8260, semi-volatile organics by USEPA 8270, and for pesticides by USEPA 8080/8081. All soil samples were non-detect with the exception the shallow soil samples from both borings. Toluene and xylenes were found in WK-13 and DDE/DDD were found in WK-16. The concentrations for toluene, xylenes, and DDE/DDD were below the preliminary remediation goals (PRGs). The deeper soil sample from both borings were non-detect for all constituents. Samples of groundwater from both borings were non-detect for all constituents. \*

#### **4.5 – Outside Maintenance Yard**

Soil samples were collected from two borings (WK-14 and WK-15) in this area. The samples were analyzed for volatile organics by USEPA 8260 and for CAM 17 metals. The volatile organics analysis for both soil and groundwater were all non-detect. Some metals were detected in the soil at concentrations below the residential PRGs with the exception of chromium, which was detected at a concentration of 240 mg/kg with a PRG value of 210 mg/kg. This PRG value assumes that a portion of the chromium is a more toxic form (hexavalent). There were no visible signs of contamination in this area and the concentration is likely to be representative of background conditions. Groundwater samples were non-detect for volatile organics and most metals. Barium was detected in the groundwater at very low levels that are considered background concentrations.

Kleinfelder well B-9 was non-detect for TPH fingerprint by EPA Method 8015M, for volatile organic compounds (VOCs) by EPA Method 8260, and for CAM 17 Metals except for Barium which was below the MCL.

### **5.0 ADDITIONAL ACTIONS**

#### **5.1 – Survey**

Each boring was surveyed to within 1.0 ft horizontally from an established benchmark. These locations are presented in Figure 5.

#### **5.2 – Soil and Water Storage and Disposal**

All decontamination rinsate, purge water, and soil cuttings were removed from the site after boring sample collection.

## 6.0 SUMMARY

The shallow soil in the landscape area and the soil between the detergent plant building and the recycle area should be field-screened for hydrocarbons during construction activities. However, the detections of hydrocarbons may be the result of interference from organic plant matter. This area is the vicinity of boring WK-5 shown on Figure 6. Groundwater in the vicinity of the detergent plant is impacted with low levels of detergent. De-watering in this area should be discharged to the sanitary sewer. The material in the former drying beds at the wastewater treatment plant should be excavated, profiled for disposal, and hauled to a landfill. These drying beds are adjacent to boring WK-11 shown in Figure 6. Overall, very little subsurface soil work is planned for the detergent plant or wastewater plant areas (Figure 6).

### 6.1 – Hazardous Materials Specifications

Data from this investigation will be used to prepare construction specifications for the contractor to remove and manage the contaminated soils and groundwater (if encountered) without disrupting the project. The specifications will identify potentially contaminated zones, describe disposal requirements, describe groundwater management activities, and establish sampling procedures if field screening indicates contamination. The specifications will also identify temporary stockpile requirements for soil storage prior to hauling to a landfill. The draft specifications for Contaminated Materials Handling and Disposal are attached in Appendix G.